Industrial Finishing

An Independent Publication Devoted To The Finishing of Industrial Products

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FEBRUARY MESSAGE

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Manufacturers of Nothing But Lacquer Products

With the Editor

FINISHING MATERIALS, EQUIPMENT AND METHODS are undergoing many changes in the process of industrial development, and these changes exercise a marked effect on manufacturing costs, production schedules, the volume of stock required to be in process, and the merits of the final finish. With competition keen in all lines of manufacturing, industrial management is forced to give attention to recently developed materials, improved equipment and better methods. It must recognize them, consider them and eventually adopt them.

As for the foreman finisher, the prospect of any changes in his department will reveal, as nothing else can, much of his character, temperament and possibilities. It will show whether the foreman is "set in his opinions", or if he is eager to learn and co-operate to the best of his ability. It will disclose whether he is short sighted or far seeing—whether he makes no preparation for possible future developments, or whether he is progressive to the extent that he investigates and keeps posted on everything in his line that's new or worth while. What manufacturing concern does not prefer to intrust its finishing to a man of the latter type, rather than to an old-fashioned working boss—skillful perhaps and faithful, but totally lacking in initiative, aggressiveness, and vision?

In the language of the shop, "it doesn't get a man anywhere" to be stubborn, or to attempt to stave off the inevitable changes incident to progress. While it is true that changes at first cause some trouble and create new problems for the finishing department, it all boils down to one thing: Changes impose upon the foreman a task which, according to Thomas A. Edison, most men will go to almost any length to avoid—the job of real thinking. Meeting and solving new problems does require some thinking.

A pleasant stimulant to thinking along these lines, and an easy way to keep informed—and reminded—regarding everything worthwhile and new in all phases of modern finishing is to read INDUSTRIAL FINISHING. Experienced and practical foremen finishers declare this is a journal of real helpfulness—every issue filled with information which is to the point, authentic and unbiased regarding the latest in materials, equipment and methods.

W. H. Rohr

Managing Editor

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Building a Good Foundation

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Modern Lacquer Solvents

Consulting engineer calls attention to the numerous and varied kinds and characteristics of different lacquer solvents and points out the folly of mixing different brands of material.

By W. J. Miskella, M. E.

THE creator of a lacquer formula is an artist and the care and effort he takes to make the final product the best possible is just as productive of results as is the work of the artist who makes a fine oil painting.

It is an erroneous idea that all makes of lacquers are very much the same and that they differ only in slight details and that the success in marketing a chosen brand depends not upon the material itself, but upon other things, such as the methods and efforts of the sales department for example. This is most emphatically not so. Each make of lacquer differs just as much from that of its competitor as one oil painting differs from another.

Three Classes of Lacquer

In general, there are three classes of lacquer solvents: high boiling, medium boiling and low boiling. Roughly, there are seven popular materials in each one of these three classes, or 21 different materials all together—and don't forget, new ones being developed all the time.

Now, these twenty-one chemical items that are available to the lacquer artist vary greatly in price; they vary in the functions that each performs; a chosen pair of them will work differently when associated with one or another of the remaining chemicals; some evaporate entirely in 30 minutes; one of them—amyl acetate—will evaporate 80 per cent of a selected amount in three hours; the same high boiling solvent — amyl acetate — when mixed in a so-called cotton solution—16-ozs. of nitro-cellulose to one gallon of solvent—will take 170 minutes to evaporate 87 per cent of the solution. This is according to tests made by Gardner and Parks.

The low boiling solvents reduce the viscosity, so that the lacquer can be applied easily with a spray. They also evaporate quickly and give to the resulting lacquer its quick drying feature. The medium boiling solvents contribute the property of "flow" to the lacquer while the high boiling solvents, being the watch dogs of the formula, stand by and prevent blushing, precipitation of the nitro-cellulose, precipitation of the particular resins that are used. Indeed, they determine the final flow and the smoothness of the film.

In the past, the spray gun used in application has been blamed for all the uneven effects, such as "orange peel," etc., but one can readily see that improper selection of the correct amount of each one of the 21 solvents could very easily contribute to this unevenness.

Perhaps one of the most interesting difficulties lies in the moisture caused by condensation due to the cooling of the surrounding

air. This would be prevented by the use of a certain amount of a high boiling solvent, due to its low evaporation rate.

Solvent Carries Responsibilities

A solvent selected to take part in a certain lacquer formula is immediately loaded down with a lot of responsibility. It must perform a certain function. Like the strands of the cable—if they all work together and each does its share, then everything is lovely.

Unfortunately, solvents that work well with nitro-cellulose do not have the same feeling toward the resins that are likely to be used in the formula. This makes it necessary to carefully proportion the different solvents so as to obtain the desired result efficiently, economically and uniformly. After all this is accomplished, it may appear that the solvents used will make the lacquer cost too much. This means that the lacquer artist has to make his formula all over again.

Here, it would be well to note that there is a radical departure from paint formulas. A variation of 10 or 15 per cent of almost any ingredient in a paint formula would probably pass muster and the material might even be used and be found to give a satisfactory result after having been applied to a surface. Not so with lacquer formulas—everything that enters in them must not only be strictly and carefully made according to high standards of purity and accuracy, but the proportions, particularly of the solvents, must not be allowed to vary at all. Lacquer solvents have no adulterants.

Amyl acetate is still one of the popular solvents in lacquers, but the amount of it that is now used in a particular formula has been greatly reduced. This is done by substituting as much butyl as the formula will stand. Butyl acetate has done a great deal to advance the cause of lacquer solvents, having reduced the disagreeable odor of amyl acetate to almost nothing. Diethyl carbonate is also being used considerably for the same purpose as butyl acetate.

Lacquer Thinners

There could be only one possible thinner to go with a lacquer built after a carefully selected formula had been determined for it, and that would be one made of the same solvents as those used in the lacquer itself. Should a customer use another make of thinner to thin a given sample of lacquer, he would not be doing justice to the manufacturer of that sample of lacquer.

Of course, it is barely possible that some other combination of solvents might accidentally produce as satisfactory results as the thinner made to go with it, but it would seem, at least theoretically, this would be wrong. Certainly, a thinner not recommended by the maker of the lacquer should be used with great hesitancy.—Paint, Oil & Chemical Review.

Cleaning Baking Japans

In production plants, where large quantities of black baking japans are used on fenders and similar parts, it is sometimes quite a problem to keep the japan in the dip tanks entirely clean. In fact, it is practically an impossibility to prevent some dirt getting into the tanks when it is considered that thousands of pieces are coated daily and each piece has hundreds of dirt particles on it, even when the utmost precautions are taken. Some of

these dust particles are washed off the coated work into the japan and, unless steps are taken to remove them periodically, the japan soon becomes so dirty that it is impossible to get clean work.

Some plants have found it advisable to have a reserve storage tank for each type of japan used. This reserve tank is used for reducing fresh material to be added to the dip tank, and as a reservoir into which the japan in the dip tank can be pumped, after being filtered or cleaned, while the dip tank is being washed out and cleaned.

In some plants this is a continuous process, the japan being pumped from the dip tank, through a filtering device, into the clean storage tank and back into the dip tank. In other plants this cleaning operation is performed at night or at the end of the week, so as not to interfere with production.

Use a Mechanical Filter

Regardless of when the filtering or cleaning is done, it is advisable to employ a mechanical filtering device. A gravity strainer or filterer would be entirely too slow.

Two types of cleaning machines are used. One is built along the same principles as a cream separator which throws the dirt particles out of the japan by centrifugal force; the other is very much like an ordinary filter press in which the japan is forced through paper and cloth under pressure, the dirt being left behind in the filter press. Some prefer one type of filter and others the other type. When properly handled each type gives good results.

When the plate-type filter press is used it is necessary to carefully select the cloth or paper through which the japan is to be filtered, in order to get clean results. There are special varnish makers' filter papers to be had, which are especially well suited to this purpose.

Naturally, the paper itself, which looks something like a piece of felt or blotting paper, does not have enough tensile strength to resist pressure from the liquid while being pumped through the press. It must be backed up either with cloth or wire screening. Ordinary 8-oz. duck serves very well for backing up the paper and preventing it from being broken by the pressure of the liquid.

If about 4-lbs. of Super-Sel or some other finely divided pigment is added to each 100 gallons of liquid, the capacity of the filter press will be greatly increased, that is, the liquid will flow through much faster and will be cleaned just as thoroughly.—H. L. Frederick.

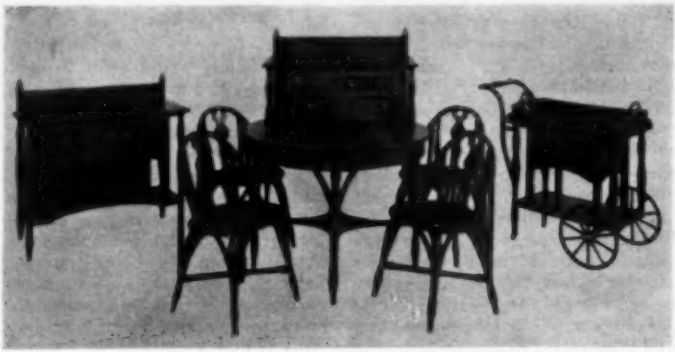
Pecora Paint Co. Elects Officers

At the 63rd Annual Stockholders meeting of the Pecora Paint Co., held January 18th, at the main offices of the company in Philadelphia, the following officers were elected for the ensuing year: S. B. Bowen, President; S. B. Bowen, Jr., Vice-President; J. J. Schisselbain, Treasurer; J. H. Johnson, Secretary.

After the meeting the Annual Dinner of the Pecora organization was held.

Peerless Pneumatic Opens Office in Grand Rapids

Peerless Pneumatic Systems, Inc., 108 N. Jefferson St., Chicago, manufacturers of Spray Painting and Finishing Equipment for furniture plants and industrial applications, has opened an office in Grand Rapids, Mich., which is in charge of Mr. Al. Van Liere, 1749 Coit Ave. N. E. A complete stock of Peerless Equipment will be maintained at Grand Rapids, and Mr. Van Liere will render co-operation and service at all times.



A very attractive and complete suite of wickerware furniture.

Staining Wickerware and Willow Furniture

Revealing some of the different kinds of materials, color formulas and methods used in the finishing of new willows and wickerware, and aged furniture made of these materials.

By A. Ashmun Kelly

THE WILLOWS are to be steeped for several hours in lime water, which is made from prepared lime, at the rate of one pint of the lime powder to from 15 to 20 pints of water. After stirring the lime into the water let it settle; then pour off the clear liquid for use. Lump lime, air slacked, was formerly employed for this purpose, but the dehydrated lime is used now.

After being steeped in this lime water for several hours, the willows are dried with heat running up to 100-degs.F. Following drying, and before becoming cold, they are steeped in a fluid stain. Brown is most commonly used, though many other colors are also employed, as the following formulas will show.

Brown Stain: Dissolve an ounce of permanganate of potash in five parts of water; dip the willows in this and lift them out at once, allowing them to drain off. This gives a pale brown, but various dark tones may be obtained by allowing the willows or wickerware a longer time in the potash solution.

Or, dissolve 4½-oz. of potash in five pints of water, and steep the willows in the fluid for two hours, then boil for two hours in a boiling solution of pyrogallis acid, made by dissolving 2½-oz. of this acid in five pints of water.

Or, dissolve 3½-oz. of catechu and 1½-oz. of soda crystals in five pints of water by boiling; steep the wickerware in the fluid for three or four hours, let it dry,

then steep for one hour in a solution of 5-oz. of bichromate of potash in five pints of water.

Blue: Dissolve 2-oz. of indigo carmine in one quart of water, and soak the wickerware in the solution for five or six hours.

Green: Dissolve 2-oz. of indigo sulphate and 1-oz. of picric acid in 50-oz. of boiling water. Steep the ware in the fluid for several hours. Different tones of green may be obtained by altering the relative proportions of the coloring matters.

Yellow: Dissolve 1-oz. of picric acid in five quarts of boiling water, and steep the wickerware in it for two hours.

All the foregoing bright colors are to be obtained only on fresh, clean stock, and on white wood. Old wickerware may be stained as described further on.

Gray: In the case of new willow ware it will be found that by coloring it a gray, the dirt and grime will not show so readily as with the unstained wood. A good gray may be obtained by dissolving 45-oz. of iron sulphate in 7½ pints of cold water. Steep the ware in this for from two to six hours; then, after drying, steep in a solution of 1½-lbs. of pyrogallic acid in five pints of water.

Staining Old Wickerware.

Dissolve 1½-lbs. of aniline nitrate and 1-oz. of copper chloride in 9½-gal. of water. Boil the ware in this fluid for an hour, and then place it in a boiling hot solution of bichromate of potash for half an hour, using 8½-oz. of bichromate to the gallon of water.

Or this: Boil 25-oz. of logwood extract in 12½ pints of water containing ½-oz. of alum. Filter or strain the fluid, and steep the wicker in it for from two to six hours. Keep the liquid at the boiling point all the time; then remove the ware from the fluid and let dry. Then steep it in a boiling hot solution of iron sulphate, 15-oz. in 7½ pints of water for from two to four hours. This gives a more or less bluish-black with a gray cast, but by steeping it in a decoction of 13-oz. of copper sulphate in 1¼-gal. of water, a deeper black will result.

The Aniline Dyes

The aniline dyes are much more effective than the foregoing mineral and chemical colors, as the anilines require no steeping. They dye the wood at once, when applied direct to the untreated surface. Aniline stains may be applied with a brush or sponge. For very bright coloring the anilines must be employed.

The wood should be mordanted, however, using a solution of 6-oz. of Castile, or any good white soap, in 12½ pints of water, soaking the wood with this, and letting it dry before application of the stain. Water-soluble ani-

Water Colors	Aniline Colors
Sap Green	Naphthol Green
Emerald Green	Emerald and Malachite Green
Scarlet	Eosin and Biebrich Scarlet
Violet	Methyl Violet and Gallein
Burnt Sienna	Bismarck Brown
Ultramarine	Cotton Blue and Alkali Blue
Sky Blue	Methylene Blue
Lemon Yellow	Picric Acid
Golden Yellow	Naphthol Yellow
Magenta	Magenta
Cadmium Orange	Phosphine, Aurantia
Crimson Lake	Congo Red

Equivalents of Water Colors in Aniline Dye Stains

lines are indicated for use, using warm water, say from 86 up to 140-degs. F. Stir the liquid well, then steep the ware in it until the desired depth of color is obtained. As the liquid dye becomes weak it should be strengthened with freshly made solution. A very small amount of aniline will do.

Dark Blue: Dissolve 3-oz. of Bengal blue in 3½ pints of boiling water, and stir and filter the fluid in ten minutes' time.

Light Blue: Dissolve 3-oz. of *bleu de lumiere* in ½-gal. of boiling water.

Sky Blue: Dissolve 3-oz. of *bleu de ceil* in ½-gal. of water.

Greenish-Blue: Dissolve 3-oz. of *bleu de vert* in ½-gal. of boiling water.

Dark Green: Dissolve 3-oz. of methyl green and ½-oz. of *bleu de lumiere* in ½-gal. of hot water. A light green may be produced by dissolving of methyl green in one pint of boiling water.

Red: Dissolve 3-oz. of coral red in five pints of water. Dark red may be had from 3-oz. of fuchine and 1-oz. of orange in three pints of water. Rose red, by dissolving 3-oz. of rose Bengal in five pints of water.

Violet: Dissolve 3-oz. of methyl violet in ½-gal. of water.

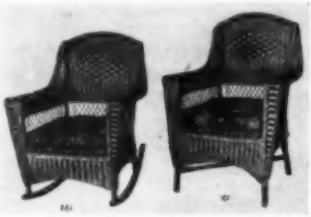
Reddish Violet: Dissolve 3-oz. of methyl violet and 1-oz. of fuchsine in ½-gal. of water.

Golden Yellow: Dissolve 3-oz. of naphthaline yellow in ½-gal. of water.

Brown: Dissolve 3-oz. of Bismarck brown in ½-gal. of water.

Chestnut Brown: Dissolve 1-oz. of maroon in one pint of water.

The foregoing list gives but a few of the many colors that can be used in staining woods, but enough are cited to show the possibilities with the aniline dye stains. The quantities of dye given in the formulas here, produce a concentrated stain, therefore you are cautioned not to exceed the amounts given. You can and sometimes will need to reduce the strength with water. As the stains are used for successive dippings they become weaker, so that they will have to be strengthened with fresh dye.



A comfortable rocker and arm chair in wickerware.

The stained wickerware is finished with a coat of lacquer. First dip the article in a thin size of glue or gelatin, which must be kept hot. This will seal the pores of the ware and give a good foundation for the lacquer.

For white goods use white shellac, and for dark use a mixture of white, or bleached shellac, and orange shellac. Some finishers use copal varnish instead, but lacquer, shellac, is to be preferred, it being more flexible than copal and less inclined to crack. For black work, dark orange shellac is used.

Staining Willowware Furniture

The stain will take more uniformly if the goods are mordanted with this preparation: Take 9-oz. of chloride of lime and 1-oz. of soda crystals in five pints of water. Several coats of this mordant are required, and each

coat must be dry before another is applied. Then apply a weak solution of sulphuric acid, and rinse at once with clear water. Let it dry. Use alcohol aniline stain, as it penetrates better than either oil or water stain. If water stain is used, apply it hot.

Experience is necessary in staining wickerware, to do it successfully; if not successful at first, don't be discouraged, but try again.

Finishing Light Colored Automobiles

When finishing automobiles with color varnish and finishing varnish, it is sometimes necessary to turn out a semi-gloss finish in light colors, especially on hearses and such work. It is not advisable to use a flat finishing varnish for this purpose, for two reasons: In the first place a semi-gloss finishing varnish would not be pale enough in color, and in the second place no semi-gloss varish is sufficiently durable to stand continued outside exposure.

One way of producing a light colored, semi-gloss finish, it to bring up the priming and surfacing coats in the regular way; then apply the ground color and color varnish, allowing plenty of time between coats. It is sometimes advisable to mix a little pale finishing varnish in the last coat of color varnish to give it greater durability. After the last coat of color varnish is hard and dry, rub it to a good surface with FF pumice stone and water, clean up the job and apply a coat of extra pale finishing varnish, which can be obtained from a number of manufacturers.

It might be advisable in some cases to add just a little of the color varnish to the finishing varnish, to give it a little color and to kill the natural yellow color of even the palest of varnishes. Of course, if any striping or decorating is to be done, it will not be possible to add the color varnish to the finishing varnish.

The coat of finishing varnish should be allowed to harden through thoroughly—sometimes as much as a week's drying time will be required. Then it should be rubbed dull with FF pumice stone and water, sponged off and wiped dry with a chamois skin wrung out of clean water.

Let the job stand over night after this rubbing operation and then rub the entire surface with a mixture of one-half raw linseed oil and one-half naphtha, using a clean cheese cloth. Dry this mixture off thoroughly with clean cheesecloth or other lint-free cloths, and there will be formed a fine dull surface with a smooth, even, durable finish that any one would be proud of.

Some people use semi-gloss enamels for producing this effect, but the finished job looks like a painted surface and does not have the depth of finish that can be secured by the above method. Also, of course, where striping and decorating are to be done, the enamel can not be used without the necessity of putting the decorations on top where they are likely to wear off.—E. C. Knoxworth.

Rauh, Inc., Buys Factory

Robert Rauh, Inc., Newark, N. J., announces the purchase of a factory having approximately 25,000-sq. ft. of floor space on property 150x237-ft., which has railroad facilities. This is one of the former M. Straus & Sons Corp. buildings at 506 Frelinghuysen Ave. However, until late in the spring, when alterations now under way are completed and new machinery is installed, the company will continue operations at its old resin manufacturing plant, 310 Elizabeth Ave.

Finishing Golf Clubs

Foreman of golf club finishing at The Crawford, McGregor & Canby Co. describes the careful preparation and very particular finishing process employed in producing high quality golf clubs

By Delone Johnson

WHEN most of us think of a piano, there comes into our minds the picture of not only an expensive piece of furniture, but also the picture of most highly polished and exquisitely finished wood. The high grade piano does indeed represent, in its finish, the finest that skilled workmen can produce.

But it would be interesting to know how many golfers think of the high grade golf club as representing, in its finish, practically the same painstaking care and preparation as is represented in the high grade piano—perhaps in some instances more, as the golf club is submitted to varying temperatures and weather of all kinds.

Seasoned by Nature

The first step in finishing a hickory golf shaft or a persimmon golf head is not made by humans, but is taken care of by Nature. For months and months, lying in open sheds protected only from actual exposure to rain, the shafts and heads are permitted to "air dry". To attempt to put a finish on these woods before they have been properly air dried, would be courting certain defeat.

The moisture in the wood, which is still largely the sap of the tree, must all be removed. Otherwise it will continue to come to the surface, whether there is a finish on it or not, and if clubs have been finished in that condition, the inside moisture will eventually remove any outside interference preventing its coming to the surface, and as a result the finish will come off. After this long period of air drying, the woods are placed in a warm room, and here the last of the moisture in them disappears. The warming rooms are not, however, dry kilns.

After these steps have been taken care of, the shafts are shaped, both by machine and by hand, for the particular model club for which they are to be used. Then they are assembled

into the heads and sent to the finishing department, where they are ready to go through a great many steps before they finally come out with a beautiful finish, rivaling that of high grade pianos.

Preparing the Surface

Any wood, to be properly finished, must first be sanded. Accordingly, the shafts are carefully sanded. Then they are dampened with a wet rag, and sanded again. This wetting causes the grain to raise so that it can be sanded off. This operation is repeated several times. It prevents the club becoming rough again after it has left the factory and is being used in all kinds of weather by a golfer. After this operation the club, of course, has absorbed a certain amount of moisture; this is withdrawn by dry running the club through a lighted gas jet.

While the shaft is still warm and its wood pores are open, so to speak, a preparation of linseed oil and pitch is rubbed into the heated wood. This permeates into the pores and protects the shaft from moisture in the future. "Oil and water do not mix", and if oil is present there is no room for the water that would otherwise come in.

The Finishing Process

Following this step, the shafts are allowed to dry for several hours, after which they are sanded lightly and stained with a solution, the formula of which we worked out several years ago. Following this staining, the shafts are again sanded lightly, and given three coats of a mixture of yellow shellac, wood alcohol and oil. They are rubbed hard and sanded between each coat. With the previous preparations, the clubs are then ready to be brought up to a high polish, which this operation gives.

In the case of a natural finish, everything is done as above, except that the staining operation is omitted.

In the finishing of our persimmon golf heads, we follow pretty closely the steps described above, varying in some of the treatments, of course. We use a different solution for staining. In order to do certain steps in the finishing, it is necessary to apply one coat of pale rubbing varnish in a room with the temperature at 80-degs. F. This must be allowed to dry a long time. Then, in order to insure a smoothly finished surface, we rub the heads with pumice stone and rubbing oil. This removes all dirt particles and any tiny bubbles that may prevent an absolutely smooth surface, after which the heads are given a high polish by the use of a specially prepared rottenstone solution.

Joins Atlantic Drier and Varnish Company

W. B. Pastorfield has been made director of sales of the Atlantic Drier & Varnish Co., Philadelphia. He was formerly with the Republic Varnish Co., Newark, N. J., as manager of the trade sales department.

Manning Abrasive's New Branches

During the last three months the Manning Abrasive Co. of Troy, N. Y., manufacturer of "Speed-grits" coated abrasives, has established three new branch offices and warehouses as follows:

Grand Rapids, Mich., at 64 Ionia Ave. S.W.; in charge of Mr. Harry M. Baxter.

High Point, N. C., at 132 W. Commerce St., in charge of Mr. John A. Russell.

Buffalo, N. Y., at 505 Pearl St.; in charge of Mr. Lewis R. Case.

These additions bring the total number of Manning Speed-grits branches up to twelve.

Handling Finished Metal Parts

Volume production of certain small metal specialties involves lacquering of large metal sheets, followed later by shearing, blanking, punching, etc., where great care must be exercised to avoid damage to finish.

By Frank V. Faulhaber

FOR good finishing, every precaution and detail warrants attention. Probably you know of a factory where finishing, that should have been first class, did not develop satisfactorily because dust was not removed from surfaces, or perhaps there was a draft, or the spraying apparatus was faulty, or there was inefficiency in the drying process, either before or after finishing. There may have been any number of other reasons.

When quality finishing has been produced, there is an obvious demand for careful handling during all succeeding operations. This demand is present, following the completion of the product, right through the sorting, checking, wrapping, packing and shipping activities. In the case of high-class name-plate products, particularly dials for watches, clocks, steam gauges, temperature recording instruments, etc., painstaking care is needed, although sometimes missing.

Machining Follows Lacquering

Sometimes surfaces are marred before the articles even reached the packing department. The spray operator has applied his lacquers correctly; the metal sheets have been dried properly, and now they await the shearing, piercing, blanking, and perhaps other machine operations, according to the nature of the work. At each operation, careful handling is imperative, but it is not always so, because some of the employees attending to these operations are not highly paid; often the employees are new and inexperienced.

In some factories girls and women are employed for most of these operations. Often they can do the work as well as men, and besides they are lighter-fingered and have a finer regard for delicate work. They are not likely to handle the work so roughly. Young men or boys usually do the shearing work. The finished metal plates have to be separated into strips, and in the case of dials and parts requiring other than straight cutting, more than one squaring operation may be necessary, depending upon the nature of the job and the particular method of manufacturing.

Silver-finished and similar high-grade work is easily scratched and marred. Therefore it is desirable, at the squaring operation, that the strips or plates make only a short drop, say only an inch or two. Sometimes each sheet or plate is promptly removed as soon as it is cut, to prevent the cut plates falling in such a way that their sharp edges may scratch the finished surfaces of other plates.

When lacquered strips or plates must be pierced, more care is necessary at handling. Light parts are usually pierced by a foot-press, but unless the work is done carefully some pieces may be

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buckled, nicked or dented. Much scratching and marring occurs that could be avoided. When the product is sent out, customers are sure to object, and where rejections follow, it is a discredit to the manufacturer.

When blanking is done, more care must be exercised, and when name-plates must be rounded at the corners, it is expedient that the workman manifest all interest in his work, so that the completed product will represent the maker's real object. Often a piece of work bearing a good quality, high-luster finish, shows, on close inspection, that some minor operation—such as the rounding of corners—has been done in a slipshod way. Thus the finishers' work is more or less neutralized. It is highly important that every small operation be accorded its share of attention.

Selection of Employes

Some lacquered work scratches and chips quite readily in the shop, but much of this can be avoided by adequate care on the part of each employe handling the product. Boys often prove careless here, and a number of manufacturers have learned through experience that men have more regard for the work and naturally exercise the right care. The slightly increased labor cost is insignificant in view of the bettered product resulting. Girls and young women, when properly coached, usually will attend to the minor operations speedily and efficiently, with a minimum amount of spoilage.

Pyroxylin Enamel

Referring to the short article on the general use of pyroxylin enamel to replace oil enamels, in the December issue of INDUSTRIAL FINISHING and signed by Edward C. H. Rottmann, while the points of superiority for certain work which Mr. Rottmann makes is concurred in heartily, there will undoubtedly be used a large amount of oil enamels on certain types of work for a long time to come.

Particularly referring to the type of undercoat to use under lacquer enamel I cannot entirely agree with Mr. Rottmann. While greater speed of drying is obtained with pyroxylin primers, the advantage in its use does not extend far beyond this point. True, it is possible to get into a great deal of difficulty by the use of unsuitable oil undercoats under lacquer; it is also possible to have considerable trouble with lacquer primers.

There are now on the market several oil undercoats, specially made for use under lacquer, which dry hard overnight for coating with lacquer, and they possess many advantages over lacquer primers, notably in that they fill the pores and imperfections of the wood or metal and deposit a thicker film in one application. Likewise the proper type of oil undercoat possesses greater adhesive properties than lacquer coatings, and usually resists chipping longer.

It is a well known fact that lacquer materials stick to the work principally by cohesion, while paint materials adhere principally by adhesion. If the paint film becomes ruptured or scratched, there is less tendency for the rupture to grow in size through continued chipping away from the edge than if a lacquer material is next to the wood or metal surface. This is principally because where a film sticks to the work by cohesion, that is,

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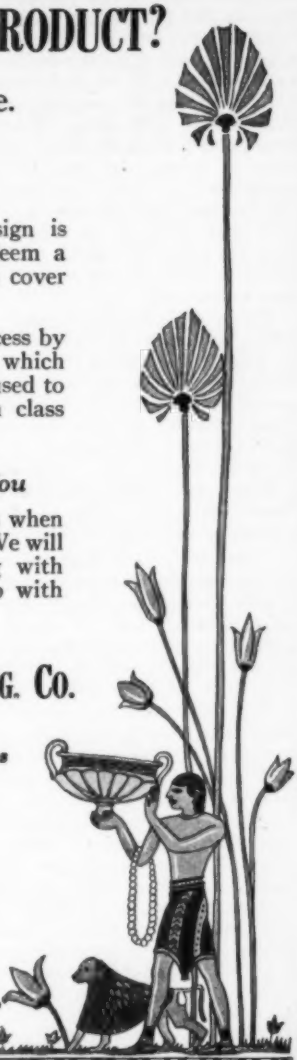

the attraction of one particle of the material for another, and this cohesive property is lessened by a break in the film, the tendency to stick to the work is lessened.

This difference between a paint primer and a lacquer primer is especially noticeable when moisture is present in considerable quantities, as it will get behind the lacquer film through a rupture and continue to cause the film to chip off, while with a paint primer the effect will be less noticeable.

There is another respect in which a paint primer of the proper construction is better suited for use under lacquer, directly next to the bare surface, than a lacquer primer. Lacquers will not stick where there is the least trace of grease, while paint primers will often adhere when there are small traces of oil or grease on the surface.

While it is true that the surface should be as nearly clean as possible regardless of the type of primer used, there is always a possibility that small traces of grease will be left on the surface, and in such cases a paint primer has a better chance to stick than a lacquer primer.

The main advantage of a properly constructed paint primer over a lacquer primer, however, lies in the additional thickness of film that it deposits. Often as much filling properties can be secured with one coat of paint primer as can be obtained with two or more coats of lacquer primer. Also, most paint primers for use under lacquer, sand easier than lacquer primers. The best type of paint primer to use is one which has been dried by the application of heat, but there are several good air-drying paint primers on the market today which dry sufficiently hard over night to be coated over with lacquer without trouble.

It should not be thought from the above remarks that the writer is opposed to the use of lacquer primers for certain classes of work. Indeed, it is the proper and most advisable form of primer to use in many cases, but there are also many cases where it is better to use a paint primer. These few remarks are offered, not as a criticism to the views of Mr. Rottmann, but merely as a supplement to his views to point out that for certain work lacquer primers are advisable, whereas for other work paint primers are more suitable. There is a large field for the use of each type of material.—W. H. Martindale.

J. C. Birdsall Becomes Vice President of The Van Camp Varnish Co.

It is announced that Mr. J. C. Birdsall, formerly with Murphy Varnish Co., has been elected Vice President and Director of Sales of The Van Camp Varnish Co., Cleveland, Ohio. Mr. Birdsall is a man of very broad experience in the paint and varnish industry, and well equipped to meet the requirements of his new position.

Old Established Companies Combine

Announcement is made of a combination of two of the oldest concerns in the paint and varnish industry, wherein the capital stock of Toch Bros., Inc., is acquired by the Standard Varnish Works, of New York. With this consolidation, Mr. Henry M. Toch becomes chairman of the board of the Standard Varnish Works, Mr. J. W. Robson remains president, Dr. Maximilian Toch becomes vice-president, Mr. James S. Wolf remains treasurer, and Mr. J. Heath Wood, president of the Standard Varnish Company of Illinois remains in charge of the western division.

It is reported that previous policies of the two companies will be maintained, and that all lines will be continued with assurance of additional facilities for handling business afforded through unification of effort in the present large factories of these companies.

Brevokrak!

New in lacquer finishes.

Let us tell you about it so you will be in a position to satisfy the growing demand for this unique, distinctive product.

It is an accepted finish for the high class furniture and fixture trades and is also popular in radio and novelty lines.

We shall be pleased to finish a few samples of your product in any combination you may select.

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Successful Finishing With Lacquers

Foreman finisher of Jasper Office Furniture Co. tells what he has found to be some of the most important features in connection with successful lacquering on wood surfaces.

By W. J. Gosman

MUCH has been said and done for and against the use of wood lacquer as a finishing material. The methods of using wood lacquer are as numerous as the objects on which it is applied. Some finishers are using it in one, two, three and more coats to produce the desired finish. Some are using it to replace one coat of varnish, following it with one or more coats of varnish which is later rubbed dull or polished.

Three coats of wood lacquer, properly put on, produce an excellent finish. Well-surfaced, well filled work, finished with three coats of wood lacquer, properly applied, can be placed alongside furniture finished with three coats of varnish over the same kind of surface, and a casual observer will not be able to distinguish the finishes, so far as looks are concerned.

Smooth Surface Necessary

The first and one of the most important requirements in producing a good lacquer finish, is a suitable surface over which lacquer is to be applied. It is very important that the surface be as smooth as possible before finishing operations begin. Smoothly sanded cabinet work will eliminate much extra labor in the finishing room, and save extra coats of material.

One cannot expect to produce a first class lacquer finish on cabinet work when the cabinet department uses nothing finer than No. 1 or No. 1½ sandpaper. Number 000 sandpaper should be used for the final sanding in the cabinet department.

Then proceed by sponging the surfaces, and again sand them perfectly smooth. Stain with a water stain, allowing about 12 hours for the stain to dry. Then apply what is called the "wash coat"—a 4-lb. cut of shellac, one part to five parts of alcohol. This carries enough shellac to stiffen the fibers of the wood so as to permit smooth sanding.

Filling Very Important

Now comes an all important operation in producing a satisactory finish; it is filling. There are a great many fillers on the market that are not suited for use under lacquer. Such fillers as contain borax, soda ash and alkali—to help hold the pigments in suspension—give the filler a false body. Such fillers do not fill the pores as well as they should and they cannot be safely used as a foundation under lacquer. Likewise, fillers that contain oil or spirit soluble colors to any appreciable extent should be avoided. Lacquer solvents will bleed them out and leave the silex show gray in the pores.

Apply a good quartz silex filler —about 12-lbs. to the gallon of

"Surface protection" should also be on an engineering basis . . .

PROTECTION of all metallic surfaces, inside and out, should receive the same scientific planning and supervision that engineers give to figuring stresses or to the lubrication of any moving part.

The days of merely painting, varnishing, or lacquering are gone forever. And, with them, are gone the quickly appearing checks, and discolorations, and scars, that play such havoc with customers' satisfaction.

DU PONT FINISHING SERVICE now offers this specialized training and experience to the end that all surfaces may be scientifically, and, therefore, more lastingly *and economically* protected.

The advice of the du Pont laboratory chemists on choice of materials and their application is freely placed at the disposal of all who request it.

In addition to the cooperation of trained Finishing Engineers, du Pont offers the widest possible range of materials for all finishing purposes. In its particular price-range and field of application, each material is of that unmistakably high quality which invariably marks every product bearing the du Pont oval.

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naptha—pad with a pad made of burlap, rubbing across the grain of the wood, and clean off with a rag, using a circular motion and finally, by wiping lightly with the grain, make sure that the surface is clean. Allow from 12 to 24 hours for filler to dry before proceeding with the first coat of lacquer.

Spraying Lacquer

In applying lacquer, much depends upon the object to be coated, the skill and experience of the operator. However a wider nozzle than that ordinarily used for spraying varnish, will be found desirable.

Air pressure also is an important factor in spraying lacquer. A pressure of from 45 to 65 lbs., with gravity feed, produces a very satisfactory, well flowed surface. Hold the gun about 8 in. from the work, using a "stiff wrist motion" and apply a wet coat, much heavier than would be applied if varnish were used.

A full wet coat seems to be the secret of successfully spraying lacquer. Allow this coat of lacquer from 5 to 12 hours to dry. If need be, sand lightly to "knock off the nibs," and proceed with the second coat. This second coat should be allowed to dry at least 12 hours before the third coat is applied. The third coat can be water or oil rubbed in 12 to 24 hours after being applied.

Rubbing Lacquered Surface

The true fullness and depth of a lacquer finish is not brought out until after the rubbing operation. The rubbing work can be hastened by using fine steel wool or water-proof sandpaper; then rub with pumice stone and oil or pumice stone and water.

It will be found that a finish brought up with lacquer requires less patching and repairing than by any other finishing material. Should the finish be damaged, it can be retouched and patched by using stick shellac.

It will be found that the rubbing operation on lacquer will take considerably longer than the rubbing of varnish, but this is appreciably offset by the saving in sanding between coats, the saving in time, and last but not least, that heretofore continuous complaint about a printed surface.

Lewis Rogers Atwood Dead

Lewis Rogers Atwood, president of the Peaslee-Gaulbert Paint Co., Louisville, Ky., and subsidiaries, died at that city on January 8, at the age of sixty-five. He was a former president of the National Paint Manufacturers' Association and of the National Paint, Oil and Varnish Association. During the war Mr. Atwood was chief of the paint and pigment division of the War Industries Board.

Murphy Varnish Co. Elects Officers

Mr. Charles J. Roh was elected president of the Murphy Varnish Co. at the meeting of the Board of Directors, January 12th. Mr. Roh was employed by the company in 1901 as an office boy and has filled successively clerical positions in the Sales Office in Newark, and the positions of assistant resident manager in Newark, manager of the Boston Office, manager of the Newark Department and Vice-president.

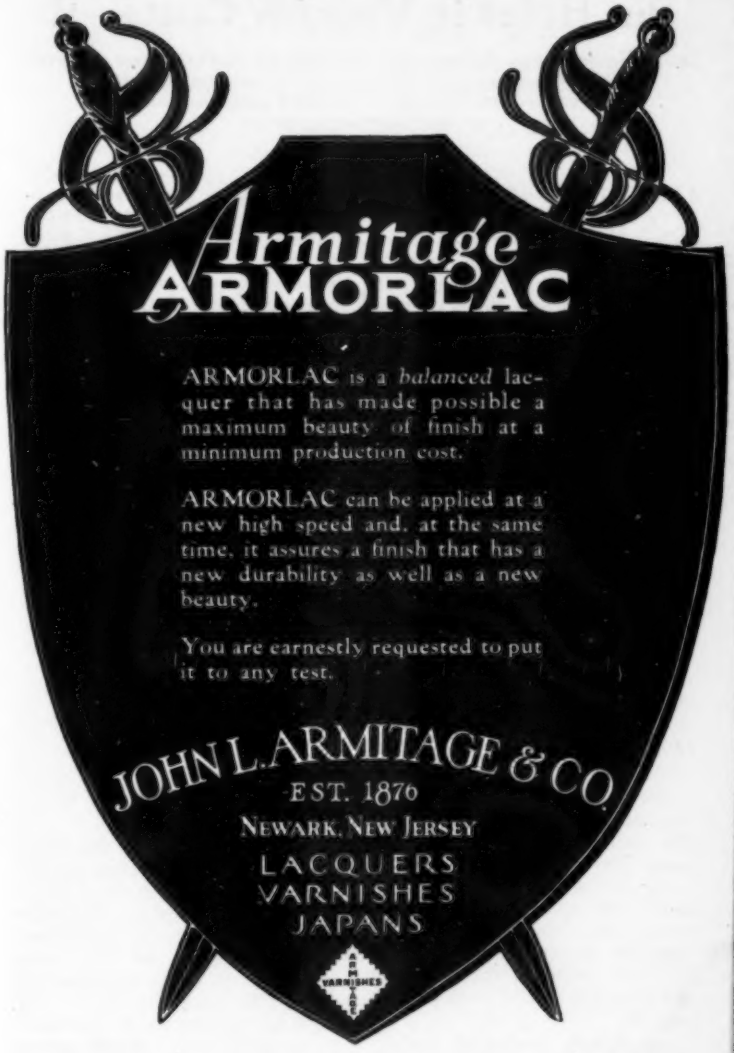
Mr. Roh succeeds Mr. John J. Nicholson, who retires from the company after completing a service of 37 years.

Mr. Paul S. Kennedy was elected vice-president, in charge of industrial business. Mr. Kennedy has been with the company for 15 years as a technical expert. He has developed a series of pyroxylin lacquer products for the company, including Murcote Spraying Lacquer and Murphy Brushing Lacquer.

Mr. Wm. H. DeCamp was elected factory superintendent in charge of the Newark factory.

Mr. Charles J. Sippi was made sales manager of distributor sales.

The company is reorganizing the sales and factory personnel in keeping with a broad policy of development.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ARMORLAC is a balanced lacquer that has made possible a maximum beauty of finish at a minimum production cost.
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Pin Holes in Varnish Coats—II

Second installment of a two-part article in which the author analyzes the chief causes and submits remedies for a fault that has caused much trouble in finish departments of woodworking factories

By P. J. Marvington

DUST IN PORES—The heat generated by the friction of the sanding operation often packs quantities of very fine dust in the pores of the veneer. This condition is worse when a belt sander is used than when hand sanding, because the sand belt is often used too long before changing.

Unless the dust is cleaned out, the pores will not hold the filler properly, and much of it will be wiped out. Furthermore, the dust will absorb moisture from the stain, with the result that although the stain coat may appear dry on the surface it will still be moist in the bottom of the pore. Either of these conditions will help cause pin-holing.

The dust should be loosened up with a stiff-bristled brush before the stain is applied, and then blown out carefully with a jet of air under high pressure.

Impurities in Stain

Salt or other injurious substances should not be present in the stain, because they may rot away the undercoat in time and cause trouble. Certain kinds of asphaltum stains are likely to cause pin-holing, especially if used too heavily on oak—due to the deep pores in the wood not allowing the stain to dry thoroughly.

Insufficient Drying of Stain

Under ordinary conditions it takes at least 24 hours for work that has been water stained to return to its normal moisture content. If the moisture from the stain is not allowed to evaporate before the other coats of finishing material are applied, pin-holing may result. Where an oil stain is used, 24 to 48 hours should be allowed to insure perfect drying in the bottom of the pores.

Improper Filling

Many authorities feel that improper filling, as a result of poor filler, careless methods, glue or dust in the pores, and poor veneer, is the cause of more pinholing trouble than all the other causes combined.

Single filling, if it is properly done, gives better results than double filling improperly done. Where single filled work gives trouble, more attention should be paid to the filling operation. If a close examination shows that the work is still improperly filled, then double filling should be resorted to.

Veneer that contains too much moisture, or that has dust packed in the pores, can be filled properly only with great difficulty. The same trouble is experienced when the pores are filled with glue. In all of these cases the filler will wipe out easily and leave air pockets which are likely to cause trouble. These causes of poor filling should be removed, if pinholing is to be eliminated.

"No one, so far as I know, was ever kept from using a Murphy Finish because it was not good enough for the job. Some have, no doubt, with a proper sense of proportion, sometimes realized that a job was not good enough for a Murphy Finish."

Announcing · A new method of wood finishing

We release to the furniture and piano manufacturer Murphy Kauriol Wood Preparation, Patented, a combined filler, stain and waterproofing material with a pyroxylin base for use as a complete undercoat with lacquer, varnish or wax. Several years of experimental work and two years of practical use permit us to promise any factory which adopts Murphy Kauriol Wood Preparation, Patented, many important advantages:

It cuts out several operations and corresponding time.
In spite of the fact that it penetrates the wood deeply it does not raise the grain.
Sanding is entirely eliminated.
Its sixteen standard colors are permanent.
Entire uniformity of product is assured.
A wonderful beauty of finish is obtained with a minimum of time and cost.
The services of an expert equipped with a thorough knowledge of its qualities, and ability to make complete demonstration of its usefulness, reliability and economy are available to any wood finishing plant.

Murphy Kauriol Wood Preparation, Patented, makes an ideal preparation coat for lacquer finishes. Lacquer applied over it forms one continuous film of great strength and durability.

May we suggest that you make an appointment for one of our men to call on you. Let us know in advance something of your present system and he will come prepared with complete data for immediate use.

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KAURIOL Wood Preparation
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NEWARK - CHICAGO - SAN FRANCISCO - MONTREAL

Preparing Filler

Reduce the filler with a good grade of naphtha to a creamy, brushing consistency. Naphtha for this purpose should have a specific gravity of about .6560 (Baume 55 degs.), a flash point of about 43 degs. F., a boiling point of about 220 deg. F. and an end point of 420 degs. F. It should contain no grease, water or other injurious substances.

As a rule 10 to 12 lbs. of filler to each gallon of naphtha, depending upon the species of wood, produces about the right consistency for brushing. Keep the filler stirred up and apply it thoroughly, but not too heavily, brushing it well into the pores. Spraying or dipping of the filler coat does not usually give as good results as brushing.

Rubbing the Filler

After the filler has flattened or "ripened" on the work until it has just enough under-moisture to allow it to be rubbed in well and to cut off clean, pound it into the pores with a good pad made from burlap, hemp or tow. The average filler requires from 15 to 20 minutes to "ripen" under good drying conditions. When wiping off the excess, use a circular motion to insure every pore being filled. Clean off with cloths by first wiping across the grain and finally by wiping lightly with the grain, being careful not to pull the filler out of the pores.

It is of importance to note here that the filler should be kept well stirred up. It is the hard pigment, silex, together with the binder in the filler, that fills up the pores and prevents the varnish coats from sinking into the wood. Do not let the silex settle in the bottom of the pot, if good work is desired.

Any filler that is mixed today and allowed to stand over until tomorrow has a tendency to get fatty and become slow drying. The filler should be mixed fresh every morning; any left over at night should be thrown away and the pots thoroughly cleaned.

There are a number of things in addition to hurried work that will cause poor filling. If the glue is forced through the veneer, it fills the pores and leaves no place for the filler to stick. As a result, most of the filler is wiped out and the varnish is applied over a glue-filled pore instead of over a properly-filled one. To help eliminate this trouble, the veneer should be thoroughly sponged with warm water before it is finally sanded. Of course, sufficient time should be given to allow this moisture to evaporate before the finishing coats are applied.

A wash coat of shellac should be applied over the stain on mahogany wood to seal the porous spots in the veneer and to bind down and stiffen the loose fibers. A gallon of 4-lb. cut shellac reduced with eight gallons of denatured alcohol is heavy enough for this purpose. If too much shellac is used, it will fill up the pores and prevent good filling; in addition there is the danger of causing a brittle finish.

Filler Material Important

Poor quality filler material is another cause of pin-holing. If soft pigments are used, or if the proper combination of oils and japan dryers are not used, the filler will be porous after it dries out and the following coats of finishing materials may soak in

RHINO-VAR

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INDUSTRIAL VARNISHES

Not one varnish for all purposes but a varnish for every purpose

Rhino-Var is not the name of a "universal" varnish, but applies to our entire varnish line. We do not believe in so-called universal varnishes (supposed to do any and all kinds of work) any more than we do in a medicinal "cure-all" for disease.

We make a separate varnish for every purpose except in a few instances where one varnish will give the desired result on more than one class of work—for example, our Interior Elastic Spar Varnish may be also applied to refrigerators, since it will not turn white in contact with water.

If you are bothered with any varnish problems, give us a chance to help you—our sixty-four years' experience is at your service. Ask for free booklet, "Pecora Varnishes," it contains some helpful information.

PECORA PAINT COMPANY

Est. 1862 by Smith Bowen — 4th St. and Sedgley Ave., Phila., Penn. — Inc. 1911

Lacquers — Enamels — Undercoats — Varnishes

enough to cause pin-holing. Only fillers made from hard silex, pure linseed oil and good filler japan, according to tried and tested formulas, should be used.

Some finishers make a practice of adding oil to filler to make it tougher. This is a very dangerous thing to do. A good filler is tough enough just as it comes from the package. The addition of oil is likely to throw the proportion of oil and filler japan out of balance, giving a mushy drying product that will remain soft in the pores. Nothing but high-grade naphtha or pure turpentine should be added to a filler, unless the manufacturer advises it for some special reason.

Proper Drying Conditions

The stain and filler should be given sufficient time to thoroughly dry in the bottom of the pores before the varnish is applied. It is as essential to have the proper drying conditions for the stain and filler coats, as for the varnish coats, if good results are to be secured.

The filled work should be stacked so the air is free to circulate and come in contact with all filled surfaces, and the proper relative humidity—35 to 45 per cent.—should be maintained at all times. At least 48 hours should be given for the filler to dry under good drying conditions.

Varnish Coats

It is sometimes a good thing to reduce the first coat of varnish with turpentine, and apply it with a brush, where trouble is experienced with pin-holing. The thin varnish will go into small holes into which a heavy varnish will not sink, much on the same principle that a thin liquid will flow through a funnel into a can easier and without the entrapped air blowing the liquid out of the funnel. Succeeding coats will follow the first one into the small holes without difficulty.

Murphy Appoints Distributors

The Murphy Varnish Co., in the month of December, appointed the following distributors: Altoona Glass & Paint Co., 1315 12th Ave., Altoona, Pa.; R. McC. Bullington & Co., 1323 East Cary St., Richmond, Va.; Hunn-Letton Paint Co., 1827 McGee Trafway, Kansas City, Mo.

F. M. Beegle Joins The Cleveland Varnish Co.

It is announced that Dr. F. M. Beegle has resigned as Research Chemist of Dodge Brothers, Inc., Detroit, and has become associated with The Cleveland Varnish Co., Cleveland, Ohio, in the capacity of Sales Engineer and General Consultant to the manufacturing department.

In returning to the paint, varnish and lacquer industry, Dr. Beegle brings back to the trade an unusually wide and ripe technical and practical manufacturing experience, supplemented by more than 15 months of constant and intimate contact with some of the latest and most modern high grade finishing processes known, many of which are the products of the research laboratories he has directed.

Dr. Beegle was graduated in 1912 with the degree of Bachelor of Science in Chemistry. After a few years' association with, and attendance at higher educational institutions, he conducted research work for the U. S. Bureau of Aircraft Production in the use of acetyl-cellulose and nitro-cellulose dopes, with their solvents for airplane finishing, in 1918. He was Chief Chemist for the American Chemical & Mfg. Co., Norfolk, Va., specializing on oils, varnishes and paints, in 1919.

He then turned toward the practical side of paint and varnish manufacture, and was Chief Chemist for The Glidden Co. of Cleveland in 1920.

Dr. Beegle spent the summer of 1921 in Holland and France, studying the processes and manufacture of Ripolin and other long oil enamels. Returning to Cleveland, he became General Superintendent of the Cleveland plant of The Glidden Co., which position he retained for the period 1922-24, when he resigned to take charge of the Research Laboratory of Dodge Bros., Inc.

Using Brush Lacquers

The long sought for brush lacquers made their debut in 1925, much to the convenience and appreciation of the home finisher and small shop finisher.

The painters, decorators and proprietors of furniture repair shops are expressing a great deal of interest in brush lacquers. Some of them have turned out excellent work, since they became acquainted with the methods of applying brush lacquers by using the long-bodied, soft hair brush.

As a finish for linoleums, one coat of lacquer should be applied when the linoleum is first laid. After the linoleum has been on the floor three months, as many coats of lacquer may be applied as desired.

One of the most essential things to practice when applying a brush lacquer is to always keep the brush thoroughly wet with lacquer, and then work fast. When it is necessary to lap one coat of lacquer to another that has been allowed to dry for, say, five minutes to twenty minutes, it is better to let the first laid coat become more thoroughly dry before adjoining it. By applying the lacquer in this way on large surfaces one can keep the work free of brush marks and traces of laps.—H. H. M.

A Fire Barely Averted

Finishers should be very careful about placing all oily waste and rags in the receptacles provided for them. If a rag drops in some place where it is apt to be overlooked when cleaning time comes, pick it up at once. Recently a finisher was doing some work that required the use of linseed oil on a cotton rag. He tossed the rag toward a container, but it went farther than intended, and dropped behind a dresser near the wall. He knew the danger of linseed oil and cotton, and intended picking it up before he left.

The good intention slipped his mind and did not return until long after he had gone home and was about to retire for the night. He was far from the factory, but he had a telephone. It was only one chance in a hundred that he might catch the night watchman in the office, or near enough to hear the bell. Luck was in his favor; he directed the watchman where to find the rag.

"If you can not find it, call me back and I will go and get it," he said. Next morning he arrived at work unusually early. The watchman showed him a charred rag, discovered just before it was ready to burst into flames.—E. Hollingzell.

New England Representative.

The Royalin Flexible Lacquer Co., of Long Island City, announces the appointment of Robert K. Hungerford to represent it in the sale of its industrial lacquer products in the New England territory. Mr. Hungerford's headquarters will be at 364 Sherman Ave., New Haven, Conn.

To Represent Pecora Paint Co.

Mr. Robert Bussum, of Reading, Pa., has joined the Pecora Paint Co. organization and will represent them in the Middle West. Mr. Bussum recently left Philadelphia for an extended Western trip.

Wood Lacquers

That give a finish that lasts. We are Pioneers in making dependable lacquers since 1857. Send requirements, get our prices.

Chas. Cooper & Co.

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Industrial Finishing

PRACTICAL PUBLICATIONS, Inc.
Publishers
Room 603, 222 E. Ohio St.
Indianapolis, Ind.

Issued monthly. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

FEBRUARY, 1926

Finishes at Motor Show

The body finishes on cars exhibited at the National Automobile Show in New York City last month, reveal lacquer to be the material mostly used, although paint and varnish jobs are in evidence on some of the higher priced cars. Close inspection shows that more care has been taken than heretofore in finishing motor car bodies from the metal on out. Apparently it is at last definitely realized that the basic and undercoats perform several vital functions, chief among them being perfect adherence to the metal and, finally, the presentation of a smooth surface of suitable body, texture and color to support the thin outer finish, which has so much to do with selling cars.

Of the many colors used, greens and grayish greens are far in the lead; blues are a poor second although they probably form a majority in the remaining color jobs.

There is still much evidence of two and three-tone color finishes, many cars having the belt color continued on to the upper cowl and bonnet panels.

There is a tendency, however, among some manufacturers of high-priced cars to depart from two and three-tone color jobs, which are becoming so common, and to go in for single solid colors (even solid lustrous blacks) relieved and ornamented only by very fine and accurate, straight-line striping—single, double or triple lines—in harmonious colors.

The use of a color in two shades to produce an effect which at a distance appears to be one uniform color, but which at close range reveals clearly the two different shades in color, is employed on some medium and high-priced cars with good results.

In the attractive color combinations, so much variation and difference appears that the methods of treatment and colors used can hardly be classified; they would have to be described in detail individually.

Some beautiful examples of natural wood finishing (in varnish) appear inside many of the finest cars at the show. The chief woods used are foreign and American walnut, mahogany and vermillion. Further ornamentation is secured through the use of inlay and marquetry, satinwood being the favorite for inlay work.

Know the Processes Which Precede Finishing

In the finishing of products manufactured of wood, it is desirable that the foreman finisher know not only the characteristics of the woods being used, but he should also know something of correct practices in the drying of wood, and its machining, gluing, sanding and bench work.

A foreman finisher may argue that this is out of his province and that he should not be con-

No Wonder It's Popular

The response from manufacturers of radio sets, furniture and other wood products to

NITRO-DONOTEX

is proof that there is a demand for a lacquer preparation costing less than $2.00.

The repeat orders from these same manufacturers prove that Nitro-Donotex answers this demand.

Nitro-Donotex can be sprayed or brushed, also rubbed.

It is of very heavy body and will stand 100% reduction by the use of our Nitro-Donotex thinner.

Order 5 gallons of each at the barrel price for trial.

DON-O-LAC COMPANY, Inc.

770 Exchange St., Rochester, N. Y.

cerned with it. Drykiln operators, machine foremen, veneer and glue room foremen, and cabinet foremen do not concern themselves with finishing. Why, therefore, should a foreman finisher inquire into or question what occurs in other departments?

Finishers, here is the reason: Finishing is the last stage of the manufacturing process, consequently everything that goes before—every operation or process to which the wood is subjected—has an effect on the wood surface which is to receive finish.

Wise finishers consider the matter in this light—that every bit of work done on the wood in process is in preparation for the finish and in this course of preparation, if anything has been slighted or performed incorrectly, the result will show up in the finishing for which the finisher is responsible. Factory management, company salesmen, buyers and the public all inspect the finished articles and judge the product accordingly. The finish must be right, or all the other work is in vain.

If anything that goes before is at fault—the drying, preliminary machining, gluing, veneering, redrying, final machining, sanding, bench work or storage—the finisher should be able to point it out; and it's another feather in his hat if he can suggest corrective measures. Finishing foremen who can do this are in line for higher salaries, and those who entertain ambitions are well equipped to make a real future for themselves.

The Finish All Important

One of the lasting impressions that modern Christmases leave is the countless variety and enormous number of toys and playthings now available. Often during the holidays the exclamation is heard from grown-ups, "If we only had some of the interesting playthings our children now have, when we were little."

Youngsters 20 and 30 years back had toys and playthings to be sure, but there were not nearly so many, not nearly the variety, and not the number of interesting things which now are so well designed, so durably made and so attractively colored.

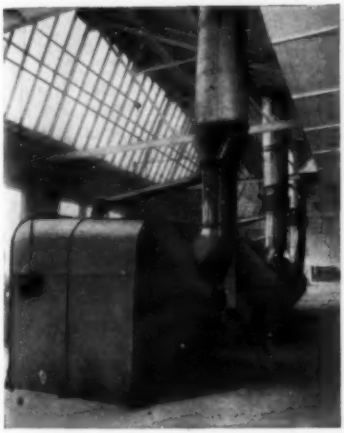
The toy industry has grown to mammoth proportions and many varieties of toys are now in demand the year around. Attractive, well-chosen colors; durable, non-poisonous finishes, and methods developed for the rapid and economical application of coatings on a quantity production basis (so as to make prices reasonable) are responsible in a large measure for the popularity of childrens' toys and playthings today.

Regardless of the novelty, the utility, or the interest appeal incorporated in a newly developed toy, however, its sales value is practically lost unless it is given an attractive and enduring finish. Many improvements and changes are taking place in the finishing of toys in modern factories.

Practically every air brush made today is provided with spray heads which are adjustable from round to flat spray.

For best results the spray gun should be held 7 to 10 in. from the work. In making strokes it is imperative that the brush be held the same distance from the work at all times.

Now, You Can Do Your Finishing BETTER, QUICKER, CHEAPER —the PEERLESS Way



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More uniform regulation of temperatures by separate air and varnish heaters with independent controls.

Pilot light signals on both varnish and air heaters indicate when current is "on" or "off."

Different colors of materials may be used by simply changing containers that fit one pressure tank.

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Save Space—Increase Efficiency

Cumbersome horizontal and twisting exhaust ducts are now removed from working spaces. Thousands of square feet of wasted floor space are now reclaimed for use. Booths need no longer be turned "exhaust back to wall". You can now give the operator the window side. He needs light—the exhaust ducts don't.

The fan works direct on the motor, —no belts to adjust, replace, give trouble, delay production. Position of the fan prevents dripping paint from being thrown back into the booth. Auxiliary Overhead Exhaust ready for use when needed.

The PEERLESS SPRAY GUN

Will not break if dropped. Records show that it sprays tons of paint without repairs. Dependable in the use of lacquers, shellacs, varnishes, enamels, oil paints, etc. Air is purified before it enters the gun and perfect atomization in the gun prevents "cloggings".

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Try it FREE for Ten Days. Then keep it only if you believe that it will out-perform any other gun, otherwise return it to us.

Tell Us What You Wish To Accomplish and We Will Show You How Peerless Can Serve You. Write Today

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Finishing Wire Cloth

Explaining the process of annealing, dipping, drying, cleaning, and rolling up the finished product; also notes on the requirements of suitable finishing material for woven iron wire cloth

By R. L. Masterson

BLACK IRON wire cloth is usually finished with a black paint, or in some cases with a gray paint to make it resemble galvanized cloth. Copper cloth and galvanized cloth usually get a coat of clear varnish to prevent oxidation and tarnishing of the wire.

Prepare Surface With Heat

From the weaving room the wire cloth is delivered to the finishing department in large rolls each containing about 1,500 lineal feet. These rolls are placed in a large oven and annealed before being finished. This process, of course, dries and burns off any slight film or grease that may have been left on the cloth from the weaving operation, and consequently the wire is in good condition to receive finishing materials when it comes from the annealing ovens.

Automatic Dipping and Drying

Practically all wire cloth is finished by an automatic dipping and drying process in which the cloth passes through a dipping tank containing the paint or varnish, then up through a drying tower and finally it is rolled into rolls ready for distribution to the trade.

To accomplish this, the large roll of annealed cloth is slipped onto an axle near the dipping tank, then the cloth is threaded over a roller on the edge of the tank, and under another one at the bottom of the tank, which insures all of the cloth being immersed.

As the cloth leaves the dipping tank and proceeds almost straight up into the drying tower, it passes through two rollers, one on either side of the cloth. These wipe off the excess material and press it into the mesh of the wire. Immediately above these rollers is a blast of air set at an angle to break the film of paint or varnish in the meshes.

The cloth then continues up into the tower where it passes over a roller in the top, and back down again to the bottom of the tower, then up again, down again and so on until it has had sufficient time to dry, which is usually from 45 minutes to an hour. The temperature in the tower is maintained by means of steam pipes at about 160 or 180-degs. F.

Requirements of the Finish

It is essential that a paint or varnish for this use be so constructed that it dries sufficiently hard, between the time it leaves the tank and reaches the first roller in the top of the tower—usually from six to eight minutes—so that it will not stick to the roller. It must also dry sufficiently hard by the time it has gone through the tower so that it will not stick together in a solid mass when rolled up at the end of the tower.

There is danger of some paints going to pieces in the dip tank

Masking Not Necessary

...in...

SPRAY PAINTING

A well-known furniture manufacturer says, "Where formerly in finishing sideboards and table tops we kept two boys busy masking, we now use

THE SPRACO
LOBSTER CLAW ATTACHMENT

and utilize the boys on other work, as masking is now unnecessary."

Finishing up to a straight line with a paint gun, and without a lineboard, **is new you will admit,** putting on two colors without one overlapping the other **is also new.** But it can be done with this auxiliary equipment.

You can get the whole story for a postal card. Ask for Bulletin 103 or tear out this page, add your address, and mail to us.

SPRAY
PAINTING AND FINISHING EQUIPMENT
SALES COMPANY
Makers of the Dependable 14-A Gun for Industrial Finishing
60 HIGH STREET, BOSTON, MASS.

due to the constant agitation and aeration of the goods by the wire cloth being pulled through them, and also having a constant stream of air on the surface of the tank from the blowers just above the tank. Some paints form a kind of scum, or bubble on top of the tank, that eventually drags itself up into the tower with the cloth and clogs the meshes.

A material to be suitable for this purpose should not have the above mentioned disadvantage. It should cover solidly in one coat, be of the proper consistency for use, set in six to eight minutes, dry hard enough by the time it leaves the tower to not stick together on the finished roll of cloth, and yet be flexible enough to stand unrolling and rerolling several months after the cloth is finished, without flaking off the wire. In addition, it must be durable under weather exposure and must make a substantial coating on all parts of the wire, especially giving a fair sized bead wherever two wires intersect, for it is at this point that moisture lodges and starts rusting of the wire.

Deal Diplomatically

In a shop that employs 125 men in the finishing department, it is very often difficult to promote peace and harmony among the workers. Many workers are not so well educated—they are not what we would call broadened out, and so when prejudices arise we must not deal too harshly with them. Furthermore it is not alone among the uneducated class that we find such human difficulties. Even among some of our finest educated people, supposedly well cultured, we find some of the most unreasonable.

When a finisher foreman is dealing with his men he often finds it hard to keep his temper in check, yet it is entirely possible to do so. In the department mentioned above, where this large number of men are employed, the foreman finisher seems to have almost perfect harmony, and this is not exaggerated one bit.

Being particularly interested to know the secret, I questioned him about this. He told me that when one of his men was angry about something he simply laughed. In other words it takes two people to make a quarrel. The foreman simply holds his temper in check until the workman has cooled off a little. Perhaps later in the day he goes and talks to the one who was angry. If the workman needed a scolding he would get it, but never while in an angry frame of mind.

Now, this may sound a little foolish, at least it did to me when I first heard it, but as I pondered over the idea, the truth about it impressed me very much.

This is a world of taking and giving. Sometimes it seems it is mostly one of taking. We are all human. Some of us are very touchy. Others have to be hammered into submission, but let each foreman study every man. If there is a real good workman who does his work satisfactorily, but is very touchy, handle him with care and use the above formula as much as possible. It works.—J. C. Hertstein, Jr.

The most fruitful cause for sags and runs in sprayed work is an incomplete understanding on the part of the workman, of his equipment.

A paint spraying establishment to operate successfully must have dependable equipment. A loss of air means delays and a loss of profit,—and perhaps dissatisfied customers.

For 20 years Brunner Compressors have been known the world over for their reliability. In keeping with this policy of quality first, Brunner complete paint spraying equipment is now being furnished to the trade.

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Questions and Answers

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Lacquer in Demand?

To what extent is lacquer going? I do no lacquer work at all, still I am doing more business than in former years, all paint and varnish work, but so many shops are using lacquer that I would be pleased to have your opinion on the subject. (Auto refinishing shop.)—J. G.

Brush Lacquer Results

We have tried several so-called brushing lacquers, but have not been able to find one that will work satisfactorily, because of the fact that, in putting on additional coats, the first coat is generally softened to such an extent that it brushes off; therefore we are unable to build up heavy enough and smooth enough to rub our tennis racquets and get the proper shine on them, and still retain sufficient body to protect the wood.—N. J. M. Corp.

Floor Crack Filler

Have you any information on crack filler for floors— a filler that will not chip out? I have tried silex filler but it chips out of large cracks. How about corn starch filler for floors (either pine or oak) and also how is it prepared?—O. M.

Gasoline Harm Lacquer?

Do you know of any objections to the use of gasoline, in first sanding of gunglaze, and finishing with No. 320 Fri-a-mite and water? Also, in sanding Duco or Nitro-Valspar lacquer, after the last coat and before polishing? Gasoline is a great time-saver in these operations, but I am wondering if it endangers the life of the lacquer materials, using it with care, that is by wetting a small area, sanding, then wiping up same immediately. I believe many painters using lacquer are asking this same question.—A. B.

Oil or Lacquer Primer?

At the present time I am using an oil base primer on all lacquer work. Have had good results and no come-back jobs. Different lacquer salesmen who call on me differ on this and claim a lacquer primer is just as good. I am in doubt about this and would like to be put straight on it myself. I know lacquer primer speeds up the work a great deal, but I am in doubt as to its durability and possible scaling or chipping easily.—B. A. P.

Effect of Frost

Does frost have a tendency to make paint peel off of metal? Why does frost effect some metal and not others under the same conditions?—C. J. B.

Floor Lacquers

Noticing that in your monthly magazine there are frequent articles and suggestions as to the application of lacquers, I would inquire if anyone has had practical experience in the use of clear lacquers on soft or hard-

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wood floors and if so, what is the comparison between this method of finishing floors and the usual method of shellac and varnish, from a standpoint of cost, appearance and durability?—A. H. C. & Co.

To Clean Metals

I will appreciate any information you may give me relative to the most economical and efficient methods of cleaning grease and rust, individually and collectively, from all metals prior to industrial finishing.—E. L. A.

Shop Ventilation

I am interested in information regarding the ventilation of a small auto paint shop. By ventilation I mean carrying off the fumes from the use of nitrocellulose lacquer.—A. O. S.

Remover Destroys Inlay

Recently I received a pair of mahogany twin beds inlaid with narrow banding and a floral design. The old varnish had to be taken off and the beds refinished. I removed the old varnish with the usual alcohol, benzol and acetone remover. After the remover had remained on the surface for some time and eaten through the old varnish, I found, to my dismay, that a considerable portion of the inlay had swelled and become softened by the action of the remover. This naturally spelt trouble.

What I desire to know is: What was this composition? What is the formula for making same? Had I known, I could have saved myself considerable work and anxiety. What liquid remover should I have used to prevent the softening of this composition inlay? When a person suspects a composition inlay, what is the best procedure to adopt in order to remove the old varnish?—C. N. P.

Finishing Polished Brass

We are very much interested to find out what you would recommend for a good finish to put on polished brass to keep its bright appearance for at least one year—whether a good clear varnish, lacquer or otherwise? It might be of interest to you to know that these polished brass plates will be exposed to the weather at all times and receive quite a lot of handling. In other words, by changing the plates around we change the readings in our signs. —F. Corp.

The ordinary type of clear lacquer, such as is used for protecting glass, brass, nickel plated work and other metal on lighting fixtures and other objects subject only to interior exposure, would not be very satisfactory for use on your brass plates if they must stand continuous exposure to the weather and to the sunlight. The actinic or chemically active rays of sunlight have a tendency to break down the toughness and good adhesion of a clear lacquer film, unless the lacquer is especially made for this use.

We understand that there are now available, however, clear lacquers which have stood several months' continuous exposure under sunlight and all kinds of weather conditions without any signs of deterioration. These would probably be satisfactory for your work.

Probably a good grade of spar varnish, which is sufficiently neutral to prevent a greenish action on the polished brass, would also

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It is made in WHITE and PASTEL SHADES as well as in positive colors. Gold, silver and bronze crackle effects are also obtainable. The size of the crackle can be varied to suit the demands of the finish.

Best results are, of course, obtained when the finish is used in conjunction with "ESCOLAC" ENAMELS and "ESCOLAC" CLEAR FINISHES.

An economical finish for wood or metal.

Write us for particulars.

EDWARD SMITH & CO.

West Ave., 6th and 7th Sts. — — LONG ISLAND CITY, N. Y.

serve your purpose. The spar varnish, however, dries more slowly than lacquer and there is also some danger of the plates sticking together, or becoming paper-marked while wrapped and in transit from you to your customer.

By getting in touch with reputable lacquer and varnish manufacturers, such as those who advertise in this publication, no doubt you will be able to work out this problem to your satisfaction.—Arliff.

You will probably find lacquer superior to varnish for your purpose, alike in point of adhesion, color and wear. There are lacquers on the market which may be dipped, sprayed or brushed—whichever is the most economical according to the size of the plate. The lacquer will be the same but a different reducer will be required for each method of application.

As you do not give the size of the plates, nor suggest the probable volume which will go through in production, we can not recommend the method which we believe you will find most desirable.

We know of some concerns who make such a lacquer, but suggest you write all of our advertisers for samples. While perhaps you can not wait to make a practical test spreading over any long period of time, a week or so of exposure should put you in a position to judge something regarding the comparative merits of lacquers.—I.F.

Dyeing Pearls

One of my customers wants me to dye color Japanese pearls that he buys in the white condition. At one time I carried on considerable business in this line without experiencing any difficulty, but now I find that, for some reason, when the strings of beads are dipped in the dye solution, many of the beads will repel the color and I cannot in any way make the color register on them. Can you advise me in any way regarding the solutions that are used, or give me a formula I can put in use?—W. J. S.

The finishing of pearls is a little out of the general line of paint, varnish and lacquer products, but we see no reason why you should not be able to get your dye to take, on these the same as previously, provided the pearls are thoroughly clean and absolutely free from any trace of oil or grease. Even if the very thinnest film of oil or grease is present on the pearls, this would probably prevent the dye solution from registering.

We suggest you first wash the pearls thoroughly with denatured alcohol, or a similar suitable solution; then dye them, being careful not to touch the pearls with the hands after they are cleaned and before they are dyed, because often the perspiration from the human body contains sufficient oily materials to sometimes prevent stain solutions from taking as they should.—I. F.

For your purpose you should use basic Aniline colors only, such as are soluble in both alcohol and water, and add to the powders five times their amount of tannic acid. Leave the pearls in the dye bath for about an hour and a half to two hours; then add acetic acid to the amount of 10 per cent of the weight of the pearls and boil

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INCORPORATED

Louisville, Kentucky

half an hour longer. This is a suggestion based on conditions similar to yours and, although successful elsewhere, it cannot be absolutely guaranteed to fit your conditions.—D. F. R.

Finishing Steel Mahogany

We contemplate the use of a mahogany finish in connection with our product, which includes compartments for modern toilets, showers and dressing rooms of rigid steel construction. Probably you, or some of your readers, are in position to give us some useful information in applying mahogany finish to materials of this kind.—H. W. Mfg. Co.

Undoubtedly you have reference to a finish resembling that on mahogany wood, with dark pores and grain of the wood showing, when you refer to a mahogany finish on steel, although a solid color of reddish brown is sometimes spoken of as a mahogany enamel. The former type of finish must be brought up with clear varnish or lacquer as the finishing coats while the latter solid covering finish is produced in much the same way as your present gray enamel finish. The solid colored mahogany enamel never closely approximates the finish on mahogany wood and we are assuming you are not interested in it.

The essential method of producing imitation mahogany on wood is to apply first a ground color or priming coat of a suitable shade to give the desired color on the lighter parts of the work, after being finished.

The ground color may be brushed, sprayed or dipped. Many manufacturers get entirely satisfactory results by dipping this first coat. This ground coat is baked hard, sanded lightly to remove any dirt nibs and given a coat of graining color of the proper shade to produce the darker grain and pores in the finished work. While this graining color is still wet it is "grained" or made to imitate the grain of wood, either by hand with the aid of suitable brushes, composition rollers or other graining tools, or by machine in which case the sheets are passed through a machine equipped with a copper plate that transfers the grain of the wood to the work.

Various graining colors are used, some being of the water color or "distemper" type, others are built on an oil paint base but so constructed as to air dry within a few hours. The most universal type of graining color is an oil color which is dried by baking. The graining color should be darker than the ground color so when it is wiped off almost clean in some parts the ground color will show through, while in other places where it is left heavier the ground color will be obscured.

After the graining color is dry, one or more coats of clear finishing material are applied—either varnish or lacquer and either air-dried or baked, though, of course, the baked finish is harder and more mar-proof than air drying finishes with the possible exception of lacquer. Sometimes the

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For BRASS

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varnish or lacquer is glossy, at other times it is rubbed dull with pumice stone and oil and at still other times a varnish or lacquer which dries with a semi-gloss rubbed effect is used.

In this connection it is possible to produce a finish entirely with lacquer materials by spraying a coat of suitably colored lacquer primer, letting it dry a few hours, applying the grain with distemper or water colors, letting the grain dry for a short time, then applying a thin coat of shellac to bind down the graining color and following this by one or more coats of flat drying clear lacquer. We believe, however, that more metal is finished to imitate wood, by the baking process with paint materials than with lacquer materials.

See following articles in previous issues of INDUSTRIAL FINISHING: "Finishing Steel Office Furniture", page 11, March 1925; "The Finish on Simmons Beds", Part I, page 10, June, 1925; Part II, page 18, July, 1925.—I. F.

Lacquer on Pine and Fir

In December issue of INDUSTRIAL FINISHING the question was asked about a nitro-cellulose finish on fir or pine. Pine is one of the least desirable woods on which to use nitro-cellulose enamel, because the soft pine of today contains so much sap. The average nitro-cellulose enamel is so strong that it draws the sap stain through, and as a result there are yellow streaks. This can only be overcome by using possibly two or three coats of shellac, preferably before any pigment is applied.

An oil primer that withstands the action of the nitro-cellulose enamel is not always satisfactory. Unless it dries in less than 24 hours it is very apt to crack after being coated with a cellulose enamel, and where there are beads, etc., they are apt to blister, since the enamel will not take a good hold here.

Fir has an alternate soft and hard grain, the dark colored grain being very hard and the light colored grain very soft. It becomes fuzzy after coating.

I can not agree that unsuccessful jobs come from spraying directly on the wood with this kind of enamel. One of the leading manufacturers of paneled furniture in this country uses this method with very good success. Since the enamel is very hard when dry, the fuzz that raises on the wood surface can be easily sanded off. When the wood is carefully prepared, it is seldom necessary to sand at all, if the spray man is careful and uses a clean color.

Here is one method used. The first coat is applied very thin; then the surface is sanded and puttied with cold-water putty, and followed with the second and third or final coats. It is seldom that more than three coats are ever used, except for white finished goods, for which four coats are applied.

According to a recent statement, one firm is using five coats of slow-drying pigments. This takes large floor space to get volume production, and besides it requires a dust-proof room for the oil enamel. With the nitro-cellulose enamel, the fast-drying and the consequent rapid moving of material—these make possible a large production and they offset the amount of finishing material used.

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The average bedroom suite of 10 to 12 pieces will take from one and a half to two gallons for each coat of this enamel in light colors; others require less. A good spray man will finish from 50 to 100 pieces a day, according to the size of the article and class of work being done. How many days will it take to produce this with slow-drying methods? This number can be done complete, in three coats, in a day of eight hours. After putting on the enamel coats, a coat of white gloss lacquer can be applied and rubbed or left "as it is." This dries fast and free from dust or pimples in a few minutes.—J. K. Cooper.

Brown Finish on Maple

The exact procedure for obtaining a high-lighted, soft brown finish on birdseye maple depends a great deal upon the exact shade desired. The so-called "antique amber finish," on birdseye and blistered maple, is now quite popular. This can be obtained by first staining the maple with an amber water stain made by dissolving antique amber water-soluble stain powder in water.

The exact shade is determined by the quantity of powder used. A solution of 1¼-oz. of powder to a gallon of water, gives quite an amber brown color, but if the proportion of powder is reduced the shade can be made as light as desired, down to the point where the water stain is entirely eliminated.

After the water stain has dried 24 hours or over night, a wash coat of white shellac should be applied either by spraying or brushing. This wash coat of shellac should be made by reducing one part of 4-lb. cut white shellac with about seven or eight parts denatured alcohol. This will be found sufficiently heavy for the purpose, which is merely to stiffen the fibres raised by the water stain and allow them to be cut off smooth when sandpapered.

When the wash coat of shellac has dried about five hours, the work should be sanded smooth with sandpaper, and then antiqued with an amber antiquing stain applied by spraying. In applying this antiquing stain, the spray gun should be held a considerable distance from the work and the stain fogged on, allowing only a little of it to strike the work near the center of the panels and increasing the quantity of stain on the work as you go out to the edge, running from a light shade in the center to a darker walnut amber around the edges.

As mentioned above, in case this amber shade which is now so popular, is darker than what you have in mind, it may be possible to entirely eliminate the water stain operation and simply antique the work by spraying the antiquing stain directly on the bare wood. After the antiquing stain, in either case, has dried about an hour, the finish can proceed in the usual way, using either lacquer or varnish.

In case lacquer is used, it is not advisable to apply more than two coats in one day. A good schedule would be one coat in the morning and the second coat late in the afternoon, the third coat being applied the following morning. Then let the work stand over night and rub it with pumice stone and oil next morning.

If varnish is used, the regular schedule required to allow the

varnish to dry sufficiently hard should be used, but the varnish should be of quite a pale color to show up the beautiful effect of birdseye maple to the best advantage.

There are also now on the market antiquing stains which are applied over the entire surface, and then wiped out with a cloth, or sanded in certain spots after they are dry, to produce the high-lighted effect. These stains dry slower than the type of antiquing stain referred to above and, since it is presumed that you have spraying equipment, you would probably find it more economical and faster to use the antiquing stains as applied by spraying only on those parts which you want to show darker, and let the natural wood blend with the antiquing amber water stain serve to produce the high-lighted effect.—T. F. Namarhoy.

Wood and Metal Paints Differ

Theoretically a different paint should be used for wood than for metal because wood is more porous and naturally absorbs a larger proportion of the liquid in the paint, than a metal surface. A properly balanced external paint, however, sometimes gives just as good results on wood as on metal.

It is generally a mistake to use asphaltum or tar paints next to the surface of wood or metal. These materials often contain sulphur and other acid forming materials which promote rust instead of retarding it. Furthermore, it is very difficult to apply a second coat of paint over many tar or asphaltum paints without having the tar or asphaltum "bleed" through all succeeding coats. In other words, it is al-

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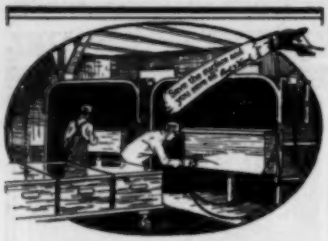

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most impossible to apply a second coat over such first coats without having certain parts of the priming coat show through the second coat of paint and spoil its appearance.

It has been shown by actual tests that many forms of graphite are rust stimulators due to small traces of acid, and due to the good electrical conductivity properties of carbon pigments. Provided a coating containing rust preventative pigments, which usually have a slight alkaline reaction, is used as a primer, a graphite paint may be used to good advantage as a finishing coat.

While a paint made of linseed oil and white carbonate of lead serves as a good priming coat on metal, such a paint is not as good as one containing more rust inhibitive pigments and other reinforcing materials. Red lead in oil works very well as a primer, but red lead settles quite hard in the bottom of the package when it is allowed to stand for some time. Certain pigments containing salts of chronium or other rust inhibitive pigments make excellent primers.—N. D. Harmeson.

Distribute Booth Suction

The spray operator in a small booth, where the small object sprayed stands immediately in front of the suction fan, rarely has any difficulty with gases or particles of material coming back in his face. Where large objects, such as automobiles, showcases and buffets, are being sprayed, the matter is sometimes quite different. This is because the suction fans are not drawing sufficiently strong from all parts of the booth.

Anyone who has stood in front

of a fan used for circulating air in a room knows that, while the current of air is very strong for a considerable distance immediately in front of the fan, if he steps to one side, he misses the draft entirely. To overcome this difficulty many office and room fans are now made so that the axis continually changes its position as the fan rotates. This causes the current of air to be more evenly distributed.

The spray booth suction fan acts on the same principle, in that its suction is more powerful immediately in front of the fan or fans, while the current outside of that track is very much diminished. One way to overcome this difficulty is to make the opening immediately in front of the fan smaller, then run pipes from the fan to various parts of the booth, so that the fan will draw uniformly from all parts of the booth. The more openings provided, and the more evenly they are distributed along the sides and top of the booth, the more evenly will the air suction be distributed.

The pipes should be installed in such a way that they can easily be taken down, as they will need cleaning at frequent intervals. The matter of keeping them clean is one that deserves careful attention. If they become clogged they will be useless for the purpose intended.—Silas B. Whitmore.

Rubbing Lacquered Surfaces

Recent changes in materials used in finishing furniture, automobiles, etc., have necessitated corresponding changes in methods of doing the work. For example, there is the change from

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varnish to lacquer as a finish coat; and from pulverized pumice to waterproof sandpaper for rubbing to a final finish. This sandpaper is a combination of a specially prepared grit and a waterproofed paper. For rubbing, it takes the place of pumice and felt.

Varnish rubbers have long experienced more or less trouble with the varnish caking on the bottom of the felt and causing scratches, unless carefully removed at frequent intervals. This same difficulty has followed the use of sandpaper in rubbing lacquer. The small particles of lacquer, removed from the surface in the process of smoothing off, collect between the cutting grits and clog them until they cannot do their work properly. This will happen whether the sandpaper is used with benzine, oil or water.

For some time I have been experimenting with a view to overcoming this difficulty, and believe I have solved the problem. I have worked along the line of getting something that would move freely among the particles of lacquer and cause them to break up into still smaller particles, and prevent them from collecting between the cutting grits.

For this purpose I use whiting in much the same way that one would use pulverized pumice with rubbing felt; that is, the sandpaper is dipped into the whiting, or the whiting may be sprinkled over the surface to be rubbed. The more whiting used, up to a reasonable limit, the more effective it will be in preventing clogging and scratching. At first thought one might imagine that the whiting would retard the

speed of rubbing, but such is not the case; in fact the time required for rubbing is slightly reduced by the use of the whiting.

One thing to be remembered, is that a great deal of water must not be used when rubbing. The same is true of oil or benzine when these are used in the place of water. Too much liquid will cause the whiting and the particles of lacquer to remain apart, and permit the latter to gather on the sandpaper.

Some concerns have discarded lacquer because they claim it is too hard to rub. If the wood surface is properly prepared for the finish, the amount of rubbing required is greatly reduced. The way the wood is filled has a great deal to do with the amount of rubbing required to produce a good finish.

The fact that lacquer dries dust-proof within a few minutes, means a cleaner surface than would otherwise be the case; and the cleaner the surface the easier it is to rub. In fact we have so perfected our method of preparing the wood for the finish, and of using lacquer, that our cost of rubbing has been greatly reduced, as now we need to rub only the more prominent parts.—Thos. A. Bezzo.

Protect Fire Extinguishers

Fire, once started in a finishing room, spreads rapidly. Fire extinguishers should always be located within easy reach, in a place where they are not apt to be knocked down. If one is knocked down the foreman should be immediately notified, so it may be recharged. Most chemical tanks contain two separated chemicals. If the tank is inverted

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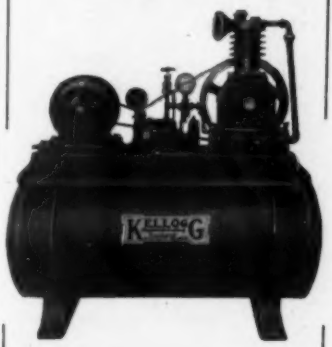

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the chemicals unite and form a gas. It is the pressure of this gas that forces the chemical out when the nozzle is opened. If an overturned tank is set back in its place the formed gas may gradually leak out, and when the extinguisher is needed there is not sufficient pressure to meet the emergency.

Recently, when a fire started in a large automobile plant, several fire extinguishers were found to be partially or entirely out of commission. Upon investigation here is what was discovered: The chemical extinguishers had been placed on pillars within easy reach of workmen, and several had been knocked down at various times. The foreman, in an attempt to stop this apparent carelessness, announced that the next man who knocked one down would be discharged. "It costs $300 every time one of those tanks has to be refilled," he declared. This did not make the men more careful about knocking down the fire extinguishers but it did make them more cautious about letting the foreman know anything about it. Reports of such accidents ceased, and the overturned fire extinguishers were replaced but not refilled. The foreman should have ordered the extinguishers hung out of range of moving objects.—S. L. Cantoner.

Why Shellac Becomes Green or Cloudy

Probably all users of shellac have had some experience with orange shellac taking on a greenish cast immediately after being applied, and white or bleached shellac turning milky before it became dry. Both are caused by the same thing, and both have a serious effect on the clearness of

the final finish. The effect is less noticeable on some finishes than on others.

On light finishes, such as natural and golden oak, and Huguenot walnut, the appearance of the finish is not seriously affected by bleached shellac becoming slightly milky after it is applied. But on the darker walnuts and mahoganies, the effect is a cloudy appearance, especially when the finishes are in a moderately strong light.

It is on the lighter finishes, however, that orange shellac shows up to a disadvantage, because the greenish cast, taken on after it is applied, never entirely disappears, and the finish never again becomes quite so clear and transparent as it should be.

Observing users of shellac have noticed that the trouble occurs only on damp days, and it is more pronounced if the shellac is applied near an open window, or where air from the outside can pass over the freshly spread material. It is because the outside air usually carries more moisture than air inside the factory; its relative humidity is higher, and as the air passes over the shellac, some of the moisture remains.

The solvents used in shellac are usually such as have an affinity for moisture. At any rate they condense the moisture in the air and cause it to be deposited on the shellac. The temperature of alcohol, which is the solvent generally used in shellac, will be found to be much lower than that of the surrounding air. It is this low temperature that causes condensation of the moisture.

Since writing the above I notice Mr. W. J. Smart's article on Lacquer Blushing, published in a recent issue of this journal. The cause of lacquer blushing is the same as that which I have been describing and I agree with all that Mr. Smart says except that, "The surrounding atmosphere cannot be dehydrated."

Unconsciously Mr. Smart points out how it can be done, and how it is done in some places, when he says, "We have all noticed, at times, water forming on the outside of a water pipe on humid days. Sometimes this has been mistaken for a leak. The reason, of course, is that the pipe being

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cold, condenses the atmospheric moisture which forms in drops on the cold surface."

In those very words we have a solution of the problem of too high a humidity in the room where both shellac and lacquer are used. It is the principle on which the humidity of modern drykilns is kept low enough to permit the rapid drying of lumber. I believe the time is not far distant when the dehydrating of air in our spray rooms will be considered an essential feature. In some shops this is done by means of coils of pipe which carry cold water; the air of the room is drawn between these pipes by means of suction fans. The cold pipes cause the moisture in the air to condense and fall as the air passes through the coil, or between the pipes, after which the air is returned to the room.

It is not enough to dehydrate the air passing through the spray line, for a good deal of the blushing is the result of the high humidity of the room in which the spraying is done. The moisture in the air comes in contact with the lacquer after it is applied.—Ralph P. Josylin.

Regardless of the kind of air brush used, it should be properly cleaned at the end of each day's service. Many guns can be satisfactorily cleaned by spraying a small amount of solvent through them; this will remove any of the material which may have accumulated.

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